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USAID Technical Report No. 21
(Document Order No. PN-AAX-288)

Capital Projects:
Literature Review
and Supplier Survey

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June 1994

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FOREWORD

Interest is growing in some parts of Congress and in the Executive Branch in using foreign assistance to advance U.S. commercial interests without jeopardizing development objectives of the U.S. foreign aid program. Congressional proposals have called for establishing a capital projects fund, a mixed credit program, as well as other trade-related programs.

Many ideas have been proposed to justify or to serve as a rationale for capital projects, and it is important to examine the empirical basis of those ideas closely. Therefore, the U.S. Agency for International Development (USAID) Center for Development Information and Evaluation (CDIE) launched an assessment of USAID and other donor experience with capital projects. The assessment comprises two parts: (1) this report, which examines data on academic research and on World Bank and USAID experience and (2) a look at USAID's efforts in Egypt, which constitute the largest of the Agency's capital projects programs.

The review of literature conducted for this report uncovered a very clear link between capital projects and economic development. Reliable facilities for transportation, power, communications, irrigation, potable water, and sanitation are universally viewed as prerequisites to development and are especially critical to private sector growth. The review of USAID projects further found that in almost all cases, projects had been designed to meet U.S. development objectives and only rarely to satisfy political or commercial interests. Poverty alleviation and basic human needs were project goals in most cases.

The literature also indicates that both World Bank and USAID projects must often deal with sustainability problems related to management, maintenance, and finance. World Bank documents identified policy reform and institutional weaknesses as two additional areas needing greater donor attention. Both donors

experience continuing difficulties in using capital projects to promote policy reform.

The assessment concludes that USAID capital projects have not been an important tool for developing commercial markets for U.S. exporters. Almost no evidence exists of USAID-financed contracts leading to any major increase in commercial follow-on sales or to contracts for U.S. exports with other donors.

1. INTRODUCTION

This report presents findings from a literature review and survey of U.S. exporters concerning the commercial and developmental benefits of capital projects. The assessment focuses on the following seven questions to analyze such benefits and to explore whether the objectives pursued by commercial and development interests conflict or necessitate tradeoffs:

Commercial Benefits

1. To what extent have capital projects leveraged other donor and private investor participation?
2. Have USAID capital projects generated commercial, follow-on sales for the United States after projects have ended?

Development Benefits

3. Have capital projects generated high economic rates of return (ERRs)?
4. Have capital projects
 - delivered important benefits to the private sector in developing countries?
 - contributed to reductions in poverty and helped to meet basic human needs (BHN)?
5. How sustainable have capital projects been?
6. Under what circumstances have capital projects helped policy reform through sector or subsector conditionality?
7. Under what circumstances and to what extent have development and U.S. commercial interests been compatible?

The report first considers findings from published

literature on capital projects to discuss the conclusions of major academic studies other than those usually conducted by development organizations, such as USAID and the World Bank. It then reviews reports on World Bank capital projects, focusing exclusively on documents that discuss developmental results. {Footnote 1} Through its project evaluations and sector reports, the World Bank has developed a sizable database on capital projects; moreover the experience of another major donor, such as the Bank, allows USAID experience to be examined in perspective. {Footnote 2}

The report also reviews documentation on 68 USAID capital projects in 25 countries. The projects selected covered the full range of capital sectors assisted: electrical power, transportation, telecommunications, irrigation, potable water, sewers, and miscellaneous construction (mainly for schools and health clinics). The documentation comprises Project Papers, audits, and, especially, evaluation reports.

Section 2 concludes with a discussion of survey responses from 44 U.S. firms that have provided equipment, materials, and services for USAID capital projects and Commodity Import Programs (CIPs). The survey was conducted to determine to what extent these firms have been able to build their USAID procurement contracts to improve their competitive position in the beneficiary country.

2. FINDINGS

2.1 Academic Studies and Other Research on Capital Projects

Published literature is scant on the issues at the heart of this assessment: the relationship between capital projects and development and the relationship between capital projects and trade. Few donors have systematically examined the impact of their capital projects on trade or on development, and little academic interest in the subject has been expressed. One reason for the paucity of information is that the increased attention paid to evaluation of capital projects coincided with the decline of interest among many donors in capital-intensive power, transportation, and other infrastructure projects. Nevertheless, this section of the report reviews the findings of some two dozen books or book-length reports addressing the development or trade benefits of capital projects. Some of the material reviewed dates to the 1960s and 1970s, when capital projects constituted a larger portion of USAID's development assistance. This older

material is particularly useful in putting the current debate on the merits of capital projects in historical perspective.

The controversy over the trade benefits of U.S. assistance began in 1959 when "tied" aid was first introduced by a USAID predecessor. At that time the debate centered around the merits of capital projects versus nonproject or program assistance. Project assistance was seen as a better way not only to promote U.S. exports but also to establish project conditionality, provide technical assistance, and improve the management of capital facilities. Later studies, however, discount the additional trade benefits of project assistance, as well as the policy leverage, and reemphasize the macroeconomic benefits, economies of scale, and reduced bureaucratization that program assistance produce.

Procurement Leveraging and Follow-on U.S. Commercial Sales (Questions 1 and 2)

There was little discussion in the literature of U.S. exports in the context of capital projects assistance. An interesting study by the British Government, however, examined the commercial benefits of Britain's capital projects program (U.K. Overseas Development Administration 1992) by reviewing eight capital assistance projects in Asia and Africa. The projects were designed not only to support development, but also to help increase British exports and employment and to develop future export markets. The study reached the following conclusions:

In relation to commercial and industrial benefits, in six out of eight cases the use of the program secured orders that would not otherwise have gone to British firms... However, few commercial and industrial benefits for the U.K. economy as a whole appear to have been realized... The commercial and industrial benefits claimed by the [U.K.] firms tended to be overly optimistic. Hardly any commercial follow-on orders were recorded that were unsupported by further aid. Follow-on business has been almost entirely restricted to spare parts. The individual firms concerned benefitted in some cases from the maintenance of capacity or the employment associated with the projects, but there are doubts about whether these constituted net benefits for the British economy... Overall, in practice very few real economic benefits for the U.K. economy as a whole appear to have been realized.

Economic Rates of Return (Question 3)

Nothing in the literature disputes the relationship between infrastructure development and economic growth. Reliable transportation, power, communications, and water and sanitation facilities are universally seen as prerequisites to development. Several other studies have found that rehabilitating infrastructure projects usually brings higher returns than investing in new infrastructure.

The merits of particular types of infrastructure and of specific projects, however, remain controversial although assessments of them have changed over time. For example, in the 1950s and 1960s, when oil prices were relatively low, economic rates of return (ERRs) to electric power generation projects were judged to be very high. But beginning in 1973 with the first oil shock, calculations of returns to large power projects began to decline. Changing economic circumstances had ushered in a search for alternative sources of energy that were often packaged in smaller facilities (e.g., mini hydro, biomass, solar). This shift also reflected increasing concern over the environmental and social impact of large power projects.

The returns to transportation projects can be high or low depending on, for example, whether roads are well maintained and increase market access. Irrigation projects are less likely to yield high returns, although such returns are usually higher in Asia than in Africa. Studies of ERRs to the construction sector are sparse and inconclusive.

Private Sector Growth (Question 4)

Infrastructure development is indisputably needed for economic growth whether growth occurs through the private or public sector or whether the infrastructure is publicly or privately owned. What is disputed is whether donors should finance infrastructure projects that are designed, implemented, and operated directly by the private sector—that is, whether donors should bypass the public sector in funding capital projects.

Proponents of private sector capital projects argue that the private sector is inherently more efficient. But others point out that even in the United States there is a mix of public and private ownership and management of basic capital infrastructure, such as power plants and transportation facilities, and that private utilities, such as telecommunications, are always closely regulated by public authorities.

The argument remains theoretical, though, because,

so far, donors have channeled almost all of their official development assistance through governments. In rare cases where innovative schemes, such as build-operate-transfer, are used, donor money generally still goes first to a government agency. Donors have, however, increasingly encouraged developing country governments to channel capital development funding to the country's own private sector enterprises for engineering and construction rather than use public sector or parastatal facilities to design or build facilities.

Poverty and Basic Human Needs (Question 4)

The arguments in the published literature over the effects of capital projects on poverty alleviation and on basic human needs (BHN) take several forms. First, there is controversy over the type of project to support. Donors concerned about the direct effects of capital projects on poverty and BHN prefer to finance low-cost housing and agricultural facilities, for example, while steering away from international telecommunications or airport projects, which are too far removed from the poor. However, some economists argue that the project's direct effect is a less important determinant of poverty alleviation than the overall effect of investment on economic growth (almost regardless of type as long as it has a high ERR). Some argue that large projects, such as major highways, which are not necessarily targeted at the poor, effect poverty alleviation more measurably over the long run than more directed projects, such as rural roads. The latter suffer from limited geographical impact, replication difficulties, and heavy reliance on administrative reform and behavioral change.

Second, even when infrastructure projects fall within subsectors that impact the poor more directly, there is no guarantee the poor will benefit. Rural electrification projects, for example, have sometimes widened income disparities in rural areas because the poorest members of the population cannot afford electricity. Opening remote areas through the construction of rural roads is sometimes a double-edged sword: although roads allow villagers to more easily move their goods to markets, they can quicken the arrival of manufacturing industries (bottled beer, for example), which may displace traditional cottage industries (home brew). Moreover, if investment costs exceed benefits, the project may not be sustained and over the long run may have negative economic consequences-which seems true for many irrigation projects. Because of the assumptions and economic models that analysts bring to this subject, the literature does not come to any firm conclusions. In general, the literature is long on theory and short on

empirical evidence.

Management, Maintenance, and Development of Institutional Capacity-Sustainability (Question 5)

The relationship between institutional capacities for managing and maintaining capital facilities and the viability of the facilities is perhaps the one issue on which the academic literature is conclusive. Innumerable studies point out that when capital projects fail or lose money, weaknesses in the institutions responsible for managing them are frequently to blame rather than technical flaws in the facilities' design or construction. There is strong evidence that donors should be investing more of their capital development funding in technical assistance and training. Moreover, in implementing institutional development projects, a donor with resident missions like USAID will have an inherent advantage over institutions like the World Bank where operations are centralized.

Conditionality and Policy Reform (Question 6)

There is no conclusive evidence that capital projects have been effective in promoting policy reform, but the literature does indicate that sector-specific policy reform (e.g., electrical power rate reforms) is essential to the success of capital projects in those sectors. The literature also suggests that sector-specific conditionality associated with projects is less intrusive and more acceptable to host countries than broader macroeconomic policy reform associated with nonproject assistance.

Compatibility of Development and U.S. Commercial Objectives (Question 7)

Studies strongly suggest that the efforts of donors to promote donor-specific commercial interests through capital projects is inconsistent with and counterproductive to the promotion of development. The argument is made that the tying of aid distorts trade patterns and promotes export of goods from markets in which the donor country is not competitive. Over the long run, the best way in which a donor can increase exports to developing countries is by promoting economic growth in the developing country, which will increase the overall demand for imported goods. Newly industrialized countries in Asia, such as Korea and Taiwan, are good examples of developing countries that are now major importers of U.S. goods and services.

Among the major bilateral donors, the United States reportedly has been least inclined to allow

commercial objectives to dominate development objectives. Possibly this is because the United States has enjoyed a technological and commercial edge in most industries, so that specific promotion devices have not been necessary. More recently, of course, U.S. competitiveness has waned, especially in favor of the Japanese—a development that has sparked renewed interest in the commercial objectives of foreign aid. Cases are cited in which U.S. businesses that had gained a temporary commercial advantage through USAID-financed procurement lost it to other countries because of changing market conditions.

2.2 World Bank Experience With Capital Projects {Footnote 3}

The review of World Bank documents included annual reports of Bank programs, synthesis reports, project reports, and topic reports for capital projects in general and for projects in several specific sectors: roads, irrigation, electrical power, and sanitation and potable water. Time and resource constraints prevented an exhaustive collection and examination of this material. The documents that were reviewed, however, are rich in relevant data.

The review of Bank documents was aimed at issues relating only to the developmental impact of capital projects (questions 3 to 6) and not to their impact on U.S. trade (questions 1 and 2) nor to the conflict between commercial and developmental objectives (question 7).

Economic Rates of Return (Question 3)

Between 10 and 15 percent is a minimally acceptable ERR, but given the opportunity cost of capital in developing countries and limited donor budgets, projects should be generating returns above 20 percent. The World Bank's 1989 Annual Review of Evaluation Results estimates ERRs on 1,065 projects. Using average rates of return for five sectors, the review found that two sectors have low ERRs, two have acceptable ERRs, and only roads have a relatively high rate (see Table 1).

The World Bank's 1991 Policy Statement reported that indicators of financial performance in the power sector have shown a steady deterioration over the last 20 years. The decline was related to increased prices for fossil fuels and a failure to charge users the full cost of providing electrical power.

The literature contained numerous examples of how capital projects helped relieve sector bottlenecks in both the power and transportation sectors. Benefits from rural road projects, for example, included increased agricultural production, access to markets, and increased rural incomes. In the power sector, industrial, commercial, and social benefits were noted. The water supply, sanitation, and irrigation sectors also contributed to economic growth, although the evidence presented was weaker than for the other two sectors. For all the sectors studied, ex post ERRs were, on average, lower than appraised ERRs.

The World Bank also judges projects against original project objectives (financial, economic, institutional, and so on) to determine whether they have been successful. Infrastructure projects were satisfactory in 85 percent of the cases, which is better than the 77 percent rate for noninfrastructure projects. Telecommunications was the best performing sector, with 96 percent satisfactory, and irrigation the least favorable, with 25 percent. Irrigation projects rated low because of problems allocating water equitably among farmers, inefficient use of water, inappropriate crops, and inadequate maintenance of irrigation facilities. The performance rates for other infrastructure sectors were: electric power (92 percent), transportation (83 percent), and water and sewage (86 percent).

Private Sector Growth (Question 4)

In the transportation and power sectors, the World Bank's capital projects are strong contributors to private-sector-led growth. Private agricultural enterprises—input suppliers, exporters, and retailers—are viewed particularly as direct beneficiaries of transportation sector projects. In the area of irrigation and potable water supply, the relationship between capital projects and private-sector-led growth is less clear. However, irrigation projects contribute to economic growth in agricultural production, and water supply projects contribute to private sector growth when they include delivery of water supplies for industrial and commercial uses as well as for public consumption.

Poverty and Basic Human Needs (Question 4)

World Bank experience shows a positive relationship between capital projects and BHN. Capital projects generate improvements in health, education, and other social sectors, with water and sanitation projects having particularly strong indirect health benefits. Even in the power sector, anecdotal information indicates that power projects contribute indirectly to education when, for example, schools and homes benefit from electric lights.

Capital projects also help reduce poverty. World Bank studies conclude that rural road projects contribute to economic development and thereby indirectly benefit the poor. Two large Bank studies of completed irrigation projects have examined 21 projects and the other looked at 46 and concluded that the projects' main social goals were met and even exceeded. These goals included job creation and improvements in farmer income.

Management, Maintenance, and Development of Institutional Capacity-Sustainability (Question 5)

One study noted that until recently the World Bank had been treating infrastructure projects as technical or engineering exercises with only modest institutional development components (Israel 1992). Projects used conditionality, often unsuccessfully, to impose financial discipline. In recent years, the Bank has broadened its focus to encompass sectoral operations geared to policy reform and sectorwide institutional reform programs. However, the Bank has had problems pushing institutional development objectives: Of the 1,250 capital projects (covering the period 1978 to 1987) with institutional development components reviewed by the Bank, only 36 percent achieved substantial project success. Because sustainability requires the achievement of institutional development objectives, it is not surprising that the outlook for sustainability is also relatively low: only 59 percent of projects were considered likely to be sustainable.

A common theme in the World Bank literature is the failure of local institutions to operate and maintain capital equipment and infrastructure sufficiently. The failure of capital projects to adequately address this problem is also typical to all sectors. Although the problem is well documented and understood and the Bank has assigned it a high priority, effective and sustainable operations and maintenance (O&M) programs are still difficult to achieve.

World Bank documents indicate that inadequate O&M is a major factor contributing to low ERRs in completed

projects. The most often mentioned determinants of weak capital projects O&M are in order of frequency

- inadequate national and local policies
- weak institutions
- untrained staff
- insufficient financial resources
- inappropriate technology, which, although not completely absent, was rarely found to be a problem

The sustainability of capital projects depends heavily on host country policies, particularly policies concerning the collection of user charges for infrastructure services. Adequate revenues from user charges are important for sustaining O&M efforts. The literature points out the importance of analyzing user willingness and ability to pay for services when projects are planned.

Community and beneficiary involvement in planning, construction, and O&M of capital projects is also cited as a requirement for ensuring sustainability of completed infrastructure.

Conditionality and Policy Reform (Question 6)

The performance of a capital project is greatly influenced by the government's economic policies for that sector. In the power sector, for example, government price controls, subsidies, and regulations on electricity rates, fuel costs, and foreign exchange greatly affect project success.

World Bank-financed capital projects that contained policy conditions were mostly ineffective. The most frequent failure in the Bank's attempt to influence sectoral policy reform was in the sustainability of user charges.

Policy issues are recognized and targeted as areas of concern to the World Bank. However, in an era of structural and sectoral adjustment, capital projects are not the only vehicle the Bank uses to promote policy reform; the Bank also focuses on the national level through macrostructural adjustment loans. This makes sense because restrictive national or macroeconomic policies have a major impact on projects.

The macroeconomic policy environment is a major determining factor influencing projects' ERRs (see Table 2); ERRs are highest in undistorted markets and lowest in distorted markets. Projects implemented in an undistorted policy climate can have, on average, ERRs that are 5 percentage points higher than ERRs for projects in a distorted climate.

2.3 USAID Experience With Capital Projects

Data from evaluations of 68 USAID-financed capital projects were analyzed quantitatively to assess results of USAID experience with capital projects. The analysis findings are organized to address consecutively the seven questions posed in Section I.

Procurement Leveraging and Follow-on Commercial Sales (Questions 1 and 2)

USAID project documentation provides little or no insight into the trade-related issues. No jointly funded (commingled) projects appeared in the sample. Parallel funding, where USAID and other donors funded related but separate projects, appeared in only two cases. Based on this sample, it does not seem that USAID projects were able to leverage other funding for U.S. procurement. No information was found on follow-on commercial sales after project completion.

Economic Rates of Return (Question 3)

In Project Papers and design documents the mean ERR was estimated to be 15.4 percent and the median, 15.5 percent. These values are high; but it is important to note that the standard deviation of 10.4 percent is also very high, meaning there is large variation among projects. Furthermore, these values are estimates; almost no information exists on rates of return once projects have ended and results may vary between when a project was designed and when it was completed. Moreover, in 24 percent of the projects, the assumptions used to generate ERRs in the Project Papers were no longer valid. These figures should therefore be interpreted with extreme caution.

Private Sector Growth (Question 4)

Project outputs were expected to contribute to private-sector-led growth in only 18 percent of the projects, as reported in Project Papers, evaluations, or audit reports. Thus it would seem that USAID projects do not target benefits specifically to the private sector. General economic growth or BHN benefits were usually cited as project benefits.

Another issue is whether the private sector was involved in project implementation. In the majority of the projects, no attempt was made to require participation of the recipient country's private sector. In 93 percent of the projects, there were neither conditions precedents nor covenants requiring

host country private sector participation in implementation. Despite the lack of conditionality however, 28 private sector companies did participate in project implementation. The breakdown by type of firm is as follows: five construction; eight engineering, design, construction, and management; eight procurement or service contractors; three machinery and equipment retailers; and four other.

Poverty and Basic Human Needs (Question 4)

In 79 percent of the projects, alleviating poverty or meeting BHN was cited as a project goal. In addition, increasing beneficiary incomes was cited in 37 percent of the projects. Evaluations of projects in the sample, however, examined mostly outputs and effectiveness rather than impact so drawing conclusions concerning the actual impact of capital projects on poverty and BHN is difficult. In 34 percent of the projects, the evaluation documents suggest that the project was or would be successful in raising incomes. The most likely BHN sectoral impacts were in education and health; these areas were cited 32 times.

Management, Maintenance, and Development of Institutional Capacity-Sustainability (Question 5)

There are several ways to approach the sustainability issue. In 56 percent of projects studied, host governments were not required to develop either new dedicated maintenance programs or institutions to support the new infrastructure; although 50 percent of the projects had host country maintenance requirements. In 60 percent of the projects, however, a participant training program was included. User charges are important for financial sustainability, but for 59 percent of the projects, no user charges were envisioned. For the completed project outputs that were to be funded by user charges (15 percent), the evaluations and/or audit reports indicate that 12 percent were not successful a very poor showing.

Conditionality and Policy Reform (Question 6)

Government economic policies strongly affect project performance. Inappropriate price controls, subsidies, and regulations can turn a technically sound project into an economic loser. Although economic policies are critical to project success, documents about the projects indicate that policy reform was not a major objective.

Conditions precedents were rarely used to obtain policy reform. In 90 percent of the projects, there were neither conditions precedents nor covenants

related to sector or subsector policy reform. Policy-reform-related conditions existed, therefore, in only 10 percent of the projects and in only 5 percent were reforms successfully adopted or implemented. When countries failed to comply with conditionality, USAID did not take steps to enforce the conditions or otherwise influence the government to adopt or implement the policy reforms.

There may be several reasons why conditions are not mentioned in the USAID project documents:

The database of information used for the review included only completed projects, many of which were started in the late 1960s and 1970s. Policy reform came into its own in the 1980s and projects begun before then often were not concerned with such reform.

Many developing countries do not want to appear to be bowing to pressure from the United States. Even though the government of the developing country may agree with reforms, it cannot accept politically the idea that the United States can tell a sovereign government how to run its economy.

To overcome this problem USAID has two approaches. The first is a "side letter" describing policy changes in detail and when they are to be made. Side letters are signed by the same officials of the developing country government who sign the USAID project agreement and are viewed as binding legal agreements. However, side letters are not publicized and do not appear in USAID Project Papers nor in other public documents. The second approach is to wait until policy reforms are implemented before approving a capital project. Clearly, if the policy change was made, it would not appear in the published agreements.

Compatibility of Development and U.S. Commercial Objectives (Question 7)

To what extent have capital projects been selected and designed on the basis of their importance to development rather than to U.S. export interests?

Analysis indicates that developmental needs rather than U.S. commercial interests were the primary goal and driving force behind USAID-financed capital projects. In only 16 percent of the projects was the sale of U.S. equipment or machinery a stated goal. However, waivers that allowed the host government to purchase goods and services from non-U.S. suppliers

were granted in only 15 percent of the projects.

To what extent has U.S. capital investment technology been appropriate to the needs of developing countries?

In a majority of the projects (79 percent of the projects studied) the technology provided by the United States was considered appropriate for the needs of the recipient. In 24 percent of the projects problems related to either inappropriate technology or operator unfamiliarity were reported.

2.4 Survey of U.S. Equipment and Service Suppliers

The fourth component of the study was a survey of U.S. firms that had been awarded contracts to provide commodities or services in connection with the 68 USAID-financed capital projects. The purpose was to determine the extent to which USAID-financed procurement had enhanced the competitive position of U.S. firms within the recipient country, through follow-on contracts with the same client or contracts with other clients in the country.

Questionnaires were sent to 84 firms and were followed with interviews conducted over the telephone. The firms surveyed included 22 technical assistance firms, 26 commodity suppliers, and 26 firms that had participated in USAID's Commodity Import Programs (CIPs)-this latter category was included to broaden the number of firms covered by the survey. Forty-four firms responded to the questionnaire and followup calls; their data were used for this analysis. These 44 firms included 15 technical assistance firms, 15 commodity suppliers that had been awarded contracts through USAID-financed capital projects, and 14 firms that had participated in CIPs.

The following paragraphs present an analysis of the responses obtained from these 44 firms. Not all of them answered all of the questions; some answered "do not know" and others could not provide an answer to certain questions.

Profile of Firms

The firms responding to the questionnaire were in general very export oriented. Almost all of the firms (38 of 44) considered overseas markets extremely important for their business and said that they engaged in aggressive marketing to obtain overseas business. Three of the firms conducted all their business overseas; for nine others, overseas sales accounted for more than 90 percent of their business. Only seven

firms did less than 10 percent of their business overseas. For all 44 firms, exports accounted for an average of 41 percent of their business. Somewhat surprisingly, however, only 14 of the 44 firms had overseas representation. It is hard to receive new export orders if a firm does not have an agent or representative overseas. The lack of overseas agents may indicate that the U.S. firms have not been that serious about increasing their exports. A longer term training relationship between the U.S. firm and the client in the developing country helps build loyalty and demand for the products and services of the U.S. firm. However, fewer than half of the firms (15) provided O&M training to the client they had obtained as a result of the USAID contract (21 firms said they did not provide training and 8 did not know or did not think the question applied to them).

Importance of USAID Business in General

The firms surveyed had contracts with USAID for between 10 and 15 years on average, although the average number of contracts during this time was surprisingly small (fewer than five). Seventeen of the firms did not consider the USAID market important to their business. Of the 27 who did consider it important, about half considered it quite important and half considered it only somewhat important. That is, most of these firms would not be considered to have an excessive reliance on USAID for significant portions of their business.

Importance of the Capital Projects Contract

The firms were asked a series of questions to help determine the importance to them of the USAID-financed contract under which they had provided commodities or services in one of the capital projects under study. When asked whether they had done business previously in the beneficiary country, about half said they had and half said they had not. Of the 20 firms that had done business prior to the USAID contract, 16 continued to do business after the USAID contract. Of these 16, 12 reported that their business volume was relatively unchanged after the USAID contract; only 2 reported an increase while 2 reported a decrease (see Figure).

The firms were also asked whether their USAID-financed contracts had led to follow-on contracts for the provision of spare parts, new machinery, or technical services. Most of the firms could not answer this question although most of those who did answer responded affirmatively. {Footnote 4}

For a significant number of firms (19), the USAID contract provided an entrance into the country. However, for 13 of these 19 firms, the USAID contract proved to be the only business they ever did in the country; only 4 of the firms for which USAID had provided entrance obtained follow-on business after the initial USAID contract (see Figure).

Leveraging USAID Contracts to Obtain Business with Other Donors

The ability of firms to use USAID contracts to obtain business from other donors was minimal. Only four firms reported that a specific USAID contract had led to business with other donors. Only nine firms responded affirmatively when asked whether business with USAID in general had led to business with other donors.

Competitiveness of U.S. Firms in USAID-Recipient Countries

A significant number of the firms that had been awarded USAID-capital-projects contracts were unable to compete successfully with non-U.S. firms. For example, when firms were asked if the host government would have contracted with them had USAID not provided funding, only 7 of the 44 replied affirmatively, 20 said no. When asked whether the cost of the commodity or the service they provided was competitive with non-U.S. firms, only 10 of the 44 said yes another 10 said no. {Footnote 5} When asked why they were noncompetitive, the firms gave a variety of responses, most of which were related to lower Japanese and European business costs, including labor, foreign exchange rates, transportation, and taxes. When all the firms were asked to list the factors that impeded increased sales in the USAID-recipient country, once again, problems related to financing or the price of the U.S. product were cited. Other, less important factors included low demand, poor support for marketing efforts within the company or by the U.S. Government, bureaucracy, and cultural barriers.

Conclusions From the Supplier Survey

The survey's small response rate and the large number of nonresponses to particular questions indicate that caution should be exercised in drawing definitive conclusions from the results. However, the data do tend to support certain conclusions confirmed by the Egypt field study.

The most important conclusion is that although USAID contracts were important at particular moments for many of the firms in this study, they were not especially important for most of the firms in terms of non-USAID business. Few firms could convert their USAID contracts into non-USAID business. Many firms considered themselves to be in a weak position competitively compared with Japanese or European firms in a condition that the USAID contracts did little or nothing to improve.

3. SUMMARY AND CONCLUSIONS

The findings from this study clearly support the proposition that capital projects contribute positively to development. The study is optimistic about the potential for capital projects to make an even stronger contribution to development in the future. However, the U.S. commercial benefits, particularly follow-on sales and market development are very difficult to identify.

The Impact of Capital Projects on U.S. Commercial Interests (Questions 1 and 2)

The findings from the review of USAID projects, as well as the published literature, indicate that the development needs of recipient countries took precedence over U.S. commercial interests in the large majority of USAID-funded projects. Commercial objectives were included in only 15 percent of the USAID projects, but even in these cases, it is not clear to what extent commercial goals, such as the support of U.S. exports, weighed more heavily than development objectives. The USAID evaluations discussed almost nothing about the actual U.S. trade benefits of capital projects. The published literature, however, leaned heavily toward the conclusion that the efforts of donors to promote donor-specific commercial interests through capital projects have not been particularly effective. One hypothesis meriting more careful documentation is that capital projects tied to a donor's exports are more likely to result in an inappropriate transfer of technology and may be inconsistent with development objectives.

The survey responses of 44 U.S. exporters and contractors providing goods and services on USAID-funded capital projects demonstrates that firms considered their USAID business to be an important part of their overseas marketing strategies. There was little evidence, however, of USAID-financed contracts leading to any major increase in non-USAID-financed follow-on sales of goods and services or to contracts with other donors after project completion.

Economic Rates of Return (Question 3)

The review of academic literature suggests that the link between capital projects and economic growth is clear. It does note that some types of capital projects contribute more to economic growth than do others—a conclusion supported by World Bank literature showing that power and transportation projects have particularly strong development benefits. The academic literature also concludes that rehabilitation of infrastructure projects has higher returns than investment new infrastructure.

World Bank literature also indicates that most completed capital projects have acceptable rates of return. The exceptions are water-supply and sanitation projects, which have low rates. However, ERRs of completed projects are usually less than when the projects were originally appraised. Although the differences were significant, with the exception of some water supply and irrigation projects, they were not enough to make the projects economically unattractive.

Private Sector Growth (Question 4)

According to World Bank literature, Bank-funded projects, particularly power and transportation, do stimulate private-sector-led growth in developing countries. This is also the finding from the academic literature. The review of USAID projects, however, found that only 18 percent of completed projects are likely to contribute to private sector growth, and only one-third of the USAID projects made use of host country engineering design, management, and construction firms during project implementation.

Poverty and Basic Human Needs (Question 4)

Reviews of World Bank and USAID project documents suggest that capital projects have a positive impact on basic human needs (BHN). Specifically cited are benefits in both donors' health and education projects. In addition documents indicate that capital projects improve beneficiary welfare—a finding that although not contradicted in the published literature is more nuanced there. {Footnote 6} The review found that 73 percent of USAID's projects had objectives related to BHN. Because USAID's overall concern with BHN in developing countries is large, it is perhaps not surprising to find that USAID-financed capital projects have included BHN improvements as a major objective.

Management, Maintenance, and Development of

Institutional Capacity Sustainability (Question 5)

The World Bank literature indicates that capital projects frequently encounter sustainability problems. One of the major reasons why these projects fail is that institutional weaknesses are not properly accounted for in project appraisal and design. But Bank documents also demonstrate an in-depth understanding of the problem and suggest strategies to improve project performance.

Other literature also points to institutional weaknesses in host country management that make inadequate O&M a major factor in project failure. Both World Bank and other literature suggest that more training of host country staff is required. World Bank documents state further that more community and beneficiary involvement in design, construction, and O&M is necessary for sustainability.

Another key issue is the inability of developing countries to collect user fees for completed capital infrastructure, irrespective of the ability or willingness of users to pay. The collection of funds from users is essential to support ongoing O&M of these completed facilities.

The literature suggests that the development of host country infrastructure management institutions, collection of user charges, and allocation of host country resources to infrastructure O&M are critical policy issues that need more attention.

The history of USAID's capital projects was similar to the World Bank's: only 55 percent of the USAID projects studied included a training component. In addition, 86 percent of the projects lacked conditions precedents or covenants requiring host country O&M commitment. And almost half of the projects that had planned to support capital facilities by user charges had problems collecting these fees.

Conditionality and Policy Reform (Question 6)

There is little empirical evidence that capital projects have been successful as vehicles of policy reform. The review of USAID capital projects showed that few projects had conditions precedents related to policy reform. It is clear, however, that the policy issues critical to the success of capital projects are well understood.

World Bank literature recommends that the issues influencing project outcomes be better addressed during appraisal and design. There is some evidence that recent projects are doing a better job of this than

projects completed in the 1980s.

Other literature suggests that project-related conditionality as opposed to macroeconomic policy reform is preferable to host countries because it is less intrusive. However, relatively few USAID-financed capital projects contained explicit policy conditionality. Some Missions preferred dealing with policy reform outside of the structure of projects through, for example, side letters or cash-transfer policy-reform programs. When conditionality was included in capital projects it was not often effective.

Compatibility of Development and U.S. Commercial Objectives (Question 7)

Whereas capital projects generally have a positive impact on development, donors' attempts to use capital projects to promote their commercial interests may, in some cases, be detrimental to development. The supplier survey revealed that, in any case, promoting commercial interests through capital projects had little long-term impact on U.S. competitiveness in USAID-recipient countries.

It is interesting to note that this issue is not new. The tying of aid was an important topic of discussion as far back as 1959, the year in which the "buy American" policy was adopted. In the 1960s, the Pearson Commission strongly criticized the imposition of commercial objectives in project financing. The history of policy dialogue between the United States and other Development Assistance Committee members in the 1960s, however, shows that the United States was the least inclined among the major donors to allow commercial objectives to dominate development objectives in either project selection or form of financing.

The review of documents from USAID capital projects seems to echo this finding as the majority of projects studied cited traditional BHN as project goals whereas fewer than 15 percent included any mention of commercial activities in regard to the project purpose. From a historical perspective, there were no tradeoffs between development and trade in USAID capital projects-development was clearly the primary objective.

APPENDIX

WORLD BANK SECTOR EXPERIENCE

World Bank Experience With Irrigation Projects

Economic Rate of Return

A 1989 World Bank study examined 21 irrigation projects, 5 or more years after project completion. Most projects made an important contribution to food production. At the time of project completion, 80 percent of the projects were judged to be satisfactory. Several years after project completion, however, only half were operating satisfactorily. The amount of area irrigated, cropping intensity, and crop yields were all less than expected. Technical performance was a problem resulting from several design flaws. Drainage systems were effective in only half of the projects. The same was true for the water supply. Physical construction proved much less durable than expected because of poor construction and inadequate operation and maintenance (O&M). Thus, projects had a shorter than expected life and delivered a reduced level of outputs during their lifetime. At the time of project design (appraisal) the average economic rate of return (ERR) was 17.7 percent, which dropped to 14.8 percent at project completion and to only 9.3 percent several years after project completion. Also several years after completion, 15 of the projects (70 percent) had lower ERRs than at first expected. Quite often the World Bank favored low cost (and low standard) construction as a means to boost ERRs. However, such an approach often harmed project sustainability.

Reductions in Poverty and Provision of Basic Human Needs

The World Bank found that the 21 irrigation projects achieved or even exceeded their goals of generating employment, containing rural-urban migration, and raising incomes of low-income farmers. The number of beneficiaries from most projects increased considerably after project completion.

In all but one project, average family incomes and standards of living improved significantly, although by less than was anticipated on a per-capita basis, because output was lower than expected and farm sizes were smaller.

Equity problems were also identified with these projects: larger farmers captured a disproportionate share of project benefits. The effects of the projects on women and children were mixed. Better social infrastructure and better access to social services benefited farm families in several projects. In other projects, cash crops often displaced women's subsistence farming crops on irrigated lands.

Sustainability

The World Bank has found that most projects placed too little emphasis on institution building. Few provided for the design of system operations and preparation of required manuals, rules, and procedures. Very few provided adequate O&M training, and there have been continuing problems with water management and systems operations. The water management agencies had difficulty securing qualified staff because of the limited availability of technicians, poor management, low salaries, and remote working conditions.

To help resolve these problems, the Bank has focused on several areas of management: improved water resources management, better coordination between irrigation and agriculture agencies, better training, larger O&M budget allocations, higher water charges, and improved farmer participation. These measures have not always solved the root problems. In some rehabilitation projects, repairs have been required only a few years after completion of the initial project, suggesting that changes need to be made in the system's fundamental design.

Operational problems are aggravated by deferred maintenance that results from inadequate funding. Lack of maintenance leads to deterioration of the assets and, when water supply is unreliable, farmers in irrigated areas are not motivated to organize themselves and participate in operating and maintaining the tertiary distributional network. When the service is poor, farmers are less willing to pay service charges.

Because of poor water management, benefits from many irrigation projects fall far short of expectations. As a result, irrigated areas are smaller and crop yields are lower than estimated at the planning stage.

Inequalities are common in the pattern of water distribution to farmers, resulting in excess water in some places and deficits in others. When the water supply is insufficient or uncertain, farmers at the head of the system take advantage of their location and take more than their allotted share.

Policy Reform

Project covenants tended to be vague and thus compliance was difficult to determine. World Bank projects generally have a covenant that requires cost recovery. Water charges, favored by the Bank, were

stipulated in every project. Bank policy stipulates that projects must at least recover their O&M costs. However, in two-thirds of the cases, O&M costs were not fully covered. In fact, funds raised through cost recovery met on average only 15 to 45 percent of O&M costs. There were very few cases where any capital costs were recovered.

In most cases where covenants dealing with water charges were breached, important factors had not been properly assessed or anticipated when the project was originally designed. In addition to political problems, poor system operations proved to be a major problem; farmers were reluctant to pay for unreliable or inadequate water supplies. Failure to comply with project covenants shows a lack of government commitment and reflects a lack of commitment as well on the part of the lending institution when it asks for a covenant it knows will not be honored in practice.

World Bank Experience With Electrical Power Projects

Economic Rate of Return

Based on an analysis of approximately 300 electrical power projects, average ERRs at the time of project design (appraisal) were 14.6 percent compared with reestimated ERRs at project completion of 11.7 percent. Also of interest are financial rates of return.

While ERRs measure the economic return to the economy, an electrical utility needs to pay its payroll, suppliers, and fuel costs. For a utility, financial rates of return determine whether the institution will be viable or not. The World Bank has found that financial rates of return for power projects have fallen from an average of 9 percent (1966-1973) to less than 6 percent in 1991. Using another measure "rate of return on net fixed assets" the World Bank found that utilities were earning only 2.8 percent in 1989. These utilities were in a very poor financial position and were able to self-finance only 17 percent of total investment on average.

Policy Reform

The Bank argues that it has had problems with some of its largest borrowers (such as India and Brazil) because the volume of Bank lending is low relative to total investment needs. The Bank lacks sufficient leverage to change inappropriate government policies. In other cases, where the Bank's portfolio is large in comparison with government resources or other donors', it has had more success in leveraging policy reforms.

The Bank reports that financial covenants are sometimes of limited effectiveness partly because changing conditions can make them politically unrealistic and partly because some borrowers have a perception that, given supply-side pressures from major shareholders, the Bank does not always invoke meaningful remedies in cases of failure to meet covenants.

Low tariffs (electricity rates) have been one of the most critical factors in poor financial performance of electricity projects. In most utilities, power tariffs are below the long-run marginal cost of supplying power. Currently, many developing countries have tariff rates that are around half the level of developed countries. Low tariffs result in inadequate earnings and lack of funds for maintenance, investment, and expansion. This often means that the quality of service declines and customers refuse to pay their bills.

Financial viability is a common problem of power projects worldwide. Because electricity supply is central to the functioning of industry and households, developing country governments keep a tight control over this sector. A policy of "cheap power" often means that excessive and inefficient electricity uses are encouraged. Inefficient and inappropriate investments and industries are also encouraged. Governments are often unwilling to raise tariffs in line with costs because of the political unpopularity of these measures, the harm of tariff increases to energy-dependent industries, and the mistaken conviction that the curbing of utility-tariff increases helps control inflation.

Basic Human Needs and Private Sector Support

Power projects provide limited direct benefits to the poor and usually do not directly relate to basic human needs (BHN). Electricity for schools and health centers are sometimes cited as benefits. Even more important for the poor, but much more indirect, are the industrial and employment benefits of power projects. Although the Bank stipulates that benefits to the poor are a criterion in funding power projects, evaluation of these benefits is lacking. Too often in World Bank documents such benefits seem to be assumed and are not examined in any detail.

The Bank emphasizes the importance of power projects for private-sector-led economic growth. Again, the Bank treats these benefits as assumed and does not examine them empirically.

Private sector participation in the power sector (private firms producing or distributing power) has been successful in China, the Philippines, and Costa Rica. It is seen as an important alternative to the traditional public sector power utility. Such an approach has financial benefits (it brings in private capital), efficiency (the private sector brings in the skills, knowledge, and management capabilities to improve operational efficiency), innovation (the private sector is more likely to seek new techniques to improve efficiency), and positive externalities (a privately owned power facility brings about more market-based policies).

Sustainability

Traditional electricity projects focus on construction and implementation with little attention to staff development. The result may be a technically sound project with poorly functioning institutions. Typical weaknesses include insufficient experience and training of key staff, inadequate facilities for training, poor management practices, and lack of familiarity with technologies and operating practices in more advanced systems.

In Latin America, the Bank found that poor maintenance and low plant reliability meant that fuel costs were \$600 million a year higher than they needed to be. Because of the low overall reliability of electricity supply, utilities have invested some \$26 billion in building reserve generating capacity that would not be needed if maintenance standards were more acceptable.

The identification of these problems has led the World Bank to expand its project appraisal function (traditionally an economic and technical evaluation) to include an investigation of the borrower's ability to operate a project. These efforts have turned much needed attention to the importance of strengthening institutional and organizational capabilities through technical and management training and centralized power grid (system) planning and management. The Bank has also encouraged utility autonomy to remove it from government bureaucratic control and misdirection.

World Bank Experience With Road Projects

Economic Rate of Return

When roads are properly constructed and incorporate an effective maintenance program, they can

achieve high rates of return. The 1991 World Development Report states that in good economic climates ERRs for completed road projects have averaged more than 25 percent, which is considerably higher than returns from other public or private investment projects.

Rural roads provide important access for rural development, allowing farmers to market produce and giving them access to public facilities, such as health clinics and schools. However, many road projects, particularly in rural areas, do not live up to expectations. The main reason is the lack of complementary agricultural development programs. Rural road improvements cannot be expected to raise agricultural production automatically.

A 1981 report by the U.K. Overseas Development Assistance organization found that the International Bank for Reconstruction and Development, IADB, and Asian Development Bank (ADB) road projects generally had rates of return of more than 20 percent. The highest impact came from new feeder roads and the lowest from situations where the road is not well integrated into community needs. The report emphasized that measuring the economic effectiveness of a project is complicated because it is invariably linked to other projects or circumstances. The chance of excluding an item of indirect benefit is as high as the chance of inadvertently double-counting components.

Policy Reform

The World Bank has had mixed success with policy reform in the transport sector. Technical or engineering reforms were usually successful, but conditions that raised political or bureaucratic problems among several agencies and ministries created many problems. The Bank recognizes that it cannot force borrowers to change policies when they do not see significant benefits or when there are unacceptable political risks.

The World Bank has had problems getting host governments to adequately fund road maintenance programs. It has had much more success persuading governments to raise fuel prices.

Efforts to improve managerial and technical skills among host government road authorities have been relatively successful, although to completely strengthen a road ministry's technical and organizational capacity can frequently take 10 to 20 years. The Bank attributes its success to the often noncontroversial nature of the required actions, the absence of the need

to consult and seek agreement from other agencies, and the prospect of more Bank-financed projects when the technical improvements are put in place.

Enforcing policy requirements on vehicle overloading has been a continuing problem. Not only has there been government resistance (as a result of the often powerful lobbying of the trucking industry) but many countries lack adequate regulation or enforcement measures.

The Bank has examined its work in transport policy reform and has found that one of the most common problems was that the Bank often started processing follow-on projects before the policy reforms required under the original project were completed. This caused borrowers to question the seriousness of the Bank's interest in policy reform.

Bank-country economic and sector work tended to be good at providing broad policy advice but weak in identifying the historical origins and rationale for existing policies and in developing a practical program for reforming them. In many cases the reforms rarely presented (1) justification for the reforms in the country context, (2) projected benefits and costs of the reforms, (3) the government's decision process under which the reforms had to be approved and then implemented, (4) the need for specific actions to overcome identified obstacles to reform, and (5) a clear timetable for implementing the reforms. Reforms also often overtaxed the borrower's administrative capacity to process and implement them. Reforms were time consuming and could not easily be completed in the 5 to 7 years of a typical World Bank operation.

Poverty, Basic Human Needs, and Private Sector Support

In interviews with World Bank staff a common technician's theme was expressed-"The Bank designs road projects that are good technical projects. The Bank is not that concerned with poverty alleviation or promoting private sector led growth...it's concerned with good projects that are economically viable and the least cost option."

The World Bank 1991 Transport Sector Review questioned the contribution of roads to basic human needs:

The average transport project is not a good vehicle for addressing issues related to poverty and women in development. Some transport projects-particularly rural roads

and urban projects-nevertheless do effect these target groups or offer opportunities for intervening to help them. With few exceptions, however, the attention given to poverty and women in development in these operations is disappointing (World Bank 1991).

Although rural roads in developing countries are generally seen to yield benefits, it is less clear how these benefits alleviate poverty. Howe (1984) came to the following conclusions: (1) There is no strong evidence to conclude that roads help to alleviate poverty, at least in the short run. (2) Benefits of road construction were generally skewed toward larger landowners and may tend to lead to land ownership consolidation. (3) Land tenancy will be a major factor in determining who benefits.

A 1981 report by the Overseas Development Assistance organization, A Synthesis of Rural Road Evaluations, made the following points: (1) Rural road projects, in terms of distributional impacts (with the exception of feeder roads), tend to help middle-income groups rather than the poorest elements of a community. (2) The benefits regarding access to health services were significant. (3) Road projects do make an impact on society; their net effect is to enhance the standard of living for the population as a whole. However, the extent of the influence of road projects depends on the extent to which poor communications lie at the heart of the development problems.

Higher transportation costs can be a significant barrier to private sector growth. The Bank's 1990 Road Monitoring for Maintenance Management manual stated that, "Road improvements and accessibility stimulate increased agricultural production, and crop diversification improved as a result of marketing opportunities. They promote rural industrialization and stimulate the economy. The importance, of course, of these multiple effects varies with the adopted improvement standards and also depends on the degree of complementary development activities" (World Bank and OECD 1990).

The Bank noted that road transport prices in Africa are on average 2.5 to 3 times higher than in other regions of the world. Thus access to new and better roads should lead directly to benefits for farmers and consumers. As the Bank states in its 1991 Economic Development Institute Report:

If farmers and manufacturers are to take advantage of reforms in agriculture and other productive sectors they must have a

dependable road system. Without efficient transport and in Sub-Saharan Africa transport means, more than anything else, roads there can be no supply response to renewed growth (Carpetis, Levy, and Wolder 1991).

Sustainability

The problem of poor maintenance are worse for roads than for other capital projects for three reasons: (1) The costs and financial requirements are large, (2) road deterioration starts out slowly but accelerates with time, and (3) road authorities are insulated from the effects of undermaintenance. When road quality deteriorates, truckers, bus operators, shippers, farmers, and others suffer the additional costs of vehicle repairs and longer travel time.

The World Bank cites several reasons why road projects failed to become effective in management and maintenance

- Lack of host government commitment

- Lack of convincing evidence that benefits outweigh costs

- Lack of participation by the host government implementing agency in project design and planning

- Lack of attention to human resource capacity of the implementing institution

- Lack of autonomy for the implementing agency

- Conflicting objectives and functions and incompatible incentives among most road authorities

- Weak public pressure for better roads

- Inadequate and unreliable funding

In a review of 127 projects (some dating to 1964) in Sub-Sahara Africa, the Bank found that institutional problems were by far the most common ones-affecting 35 percent of the projects. Only one third were rated as having an acceptable level of institutional preparation and performance.

Mobilizing resources for maintenance is crucial to ensure project sustainability. In 51 percent of rural road projects, sources of funding for maintenance after construction were left unspecified when the project was

designed. Only 26 percent of 127 projects reviewed could be regarded as having well-planned maintenance funding.

FOOTNOTES:

1. U.S. commercial impacts were not included because the World Bank does not engage in trade promotion.
2. Three sector reports emerged from this assessment of Bank experience on irrigation, electrical power, and roads. The most important findings of these are included in the appendix.
3. A more detailed discussion of World Bank projects in irrigation, electrical power, and roads appears in the appendix.
4. The answers were as follows:

Spare parts: Yes=16, No=9, N/A=19

New equipment: Yes=12, No=9, N/A=23

TA services: Yes=12, No=3, N/A=29

5. That 19 of the respondents did not know if their prices were competitive is somewhat surprising because, as indicated before, the vast majority of these same respondents reported that overseas markets were very important to their business and that they engaged in aggressive marketing overseas. Possibly they were in fact not that effective at overseas marketing.
6. The literature dwells mainly on theory (without much empirical data) and points out some potential negative impacts of capital projects on BHN.

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